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COVERAGE AND QUALITY OF HOME AND HEALTH FACILITY BASED, MATERNAL AND NEWBORN POST PARTUM / POST NATAL CARE (PPPC) SERVICES IN KRISHNAGIRI DISTRICT, TAMIL NADU, SOUTH INDIA - A COMMUNITY BASED ASSESSMENT

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ABSTRACT

Introduction

Having achieved MDG 4, Tamil Nadu Government is keen to reduce IMR to below 15/ 1000 live births by 2015. Birth Asphyxia (26%), congenital anomalies (20%), Post Asphyxial deaths (14%) and Neonatal Sepsis(11%) account for 70% of neonatal mortality. With 99% institutional deliveries and >95% women staying in health facilities for 48 hours after delivery, the nearly 62% of Birth Asphyxia and 70% of Neonatal Sepsis deaths within 48 hours and after 7 days of delivery respectively, questions the quality of PPPC services. We conducted a study to assess the coverage and quality of home and health facility based PPPC services and describe associated factors in Krishnagiri district.

Methods

Adopting a community based cross sectional study and cluster sampling design, we included recently delivered mothers (28 - within 48 hours; 225 after 8-12 weeks of delivery) and, all available health care providers, from the 15 selected clusters (PHCs). Interviewing mothers and health professionals we collected data on: coverage/ quality of PPPC services, and associated factors e.g. staff, funds, equipment, awareness of danger signals, supervision, time allocation for PPPCs. We calculated proportions, Prevalence Ratios at 95 % Confidence Intervals.

Results

Sixteen percent of mothers received no PN visits. Only 56%, 53% and 36% mothers received PN visits as per IMNCI, GOTN and GOI guidelines respectively; 37% mothers and 18% newborns received all recommended services; 100% mothers unaware of danger signals; nil supervision/documentation of PPPC services; only 12% VHNs aware of IMNCI recommended PN visits.

Conclusions

Both home and health facility based PPPC services need to be strengthening. We recommended refresher training in IMNCI, Skilled Birth Attendant and Essential Newborn Care for VHNs, SHNs, MOs, SNs, monitoring of training quality, supportive supervision and establishing routine postnatal clinics in all PHCs.

KEYWORDS: Post Partum, Postnatal, Infant Mortality, Neonatal Deaths, Supportive Supervision

INTRODUCTION

At the turn of the 20th century, UNDP and WHO mooted the Millennieum Development Goals (MDG) to be

achieved by all signatory countries over a 25 year period (1990-2015). MDG 4 in particular concerns effecting a two third reduction in mortality among children aged less than 5 years by the year 2015 based on 1990 estimates.

In India the infant mortality rate (IMR) and neonatal mortality rate (NMR) have declined substantially between 1990 to 2009 with IMR falling from 84 to 50 and an NMR of 34 in 2009. [1,2] Interstate differentials in IMR persist with smaller states like Goa (10), Manipur (16) and Pondicherry (22) performing better. In Kerala, infant mortality rate remained static at 12/1,000.[3]

The southern state of Tamil nadu in India has more than halved its IMR from 57 in 1991 to 20 in 2009.[3] The state government has now set itself a target of bringing down IMR to 15/1000 live births by 2015.[3] Since NMR accounts for nearly 70% of IMR,[4] further reductions in IMR requires effective reductions in NMR.

Despite near 100% antenatal registration and 99 % institutional deliveries in the state, 40% of infant deaths occur in government hospitals. Nearly 15% infant deaths occur within 24 hours of birth. About 29% of the deaths occur at home of whom about 38% occur in the first one week questioning thus the quality of both Home and Health facility based newborn PPPC services provided.[5]

The Postnatal/postpartum period is defined as the period immediately after delivery of the child and extends for a period of 42 days after delivery. Postnatal/ postpartum services include care provided to a pregnant woman and her newborn child immediately after delivery and up to 42 days[6.] WHO recommends a 6-6-6-6- regimen of care visits viz., at 6 hours, 6 days, 6 weeks and 6 months after delivery[7]. Various governments have adopted regimes to suit their specific needs. The Government of Tamil Nadu (GOTN) had recommended 5 postnatal (PN) visits. In 2011, the Govt of India (GOI) recommended 6 and 7 PN visits for institutional and home deliveries respectively[8].

While the National Family Health Survey (2005-06)[9] reported that only 42% women received postnatal care, in 2009 the UNICEF coverage evaluation study suggested that only 8% of mothers receive care within 3-7 days of delivery[10]. So far no formal studies assessing the coverage and quality of PPPC services provided in Tamil Nadu have been undertaken.

We therefore conducted a community based study to: (i) Assess Health Facility and Home based Maternal and Newborn PPPC services in terms of coverage and quality in Krishnagiri district, Tamil Nadu, (ii) Describe the factors likely to be associated with coverage and quality of health facility and home based maternal and newborn PPPC services in Krishnagiri district, Tamil Nadu and (iii) Recommend measures to strengthen PPPC services for in Krishnagiri district of Tamil Nadu based on the results of the above assessments.

STUDY SETTING

This study was conducted in Krishnagiri district of Tamilnadu, which comprises 2 revenue divisions (Krishnagiri and Hosur), 5 taluks (Krishnagiri, Hosur, Pochampalli, Uthangarai and Denkanikotta.) and 10 Panchayat Unions (Kelamangalam, Thali, Krishnagiri, Shoolagiri, Vepanapalli, Hosur, Kaveripattinam, Bargur, Mathur and Uthangarai). The district has a population of 15, 46, 700. (Males -8, 10, 136 and Female -7, 50, 892). Population density is 301 per square kilometre and literacy rate is 58.11% - one of the lowest in the state. The district has 10 blocks and 39 PHCs at the time of the survey.

METHODS

Study Design and Sampling

During August 2012, we conducted a cross sectional survey of recently delivered pregnant women (within 48 hours and 8-12 weeks of delivery), Medical Officers (MOs), Staff Nurses (SNs), Village Health Nurses (VHNs), Sector Health Nurses(SHNs) and ASHAs, selected Primary Health Centers (PHCs) and homes of recently delivered mothers due for a postnatal visit.

Using a cluster and PPLS sampling procedure, 40% reported coverage (proportion of pregnant women receiving all recommended postnatal visits), 10% Absolute Precision, 95% Confidence Interval, Design Effect of 2.4 and 0.01 rate of Homogeneity, we estimated a sample size of 15 clusters and 15 recently delivered pregnant women from each cluster (PHC) to yield a total of 225 pregnant women for assessment of home based maternal and newborn PPPC services. We also included all VHNs (94), SHNs/CHNs (16), ASHAs (18) from the 15 selected study PHCs who were available and willing to participate in the study. We accompanied the VHNs / ASHAs to the homes of 12 recently delivered pregnant women who were due for a postnatal visit at the time of our survey.

For assessing health facility based maternal and newborn PPPC services, we surveyed all pregnant women within 48 hours of delivery (20) available in the 15 selected study PHCs at the time of our survey, all MOs (22) and SNs (28) who were available and willing to participate in the study and 15 selected study PHCs for availability of staff, equipments, drugs, supplies and transport facilities.

Data Collection

Using an interview schedule consisting of semi structured questions, we collected information from: (i) recently delivered pregnant women (Identification, socio - economic, ANC, & delivery details, number of PN visits received, types of PN services received, knowledge of pregnant women on danger signals and postnatal care practices for self and newborn), (ii)MOs, SHNs, VHNs and ASHAs (Duration of service, Training recd for PPPC, Number of PN mothers visited, Number of PN visits per PN mother, details of care and advise given, Knowledge of PPPC services to be provided,

With an observational checklist we visited and collected information from: (i) PHCs regarding availability of staff, newborn care corner, equipment, drugs and supplies, Quality of care given to mothers and their newborns at the PHC, number of pregnant women staying in the PHC for 48 hours after delivery and (ii) Homes of recently delivered pregnant women due for a postnatal visit to observe the quality of care and advise given to mothers and their newborns at home.

Data Quality

All field investigators were trained and data collection instruments pilot tested prior to use. Every 10^{th} schedule was cross checked by trained field supervisors. All data were entered twice by two independent data entry operators.

Data Analysis

We estimated: (i) the proportion of pregnant women receiving all PN visits as per recommendations, (ii) proportion of pregnant women and their newborns receiving all recommended PPPC services,(iii) proportion of pregnant women staying in health facility for 48 hours after delivery (iv) Number of PHCs with adequate staff, equipments, drugs and supplies, fuel and transport facilities, (v) Number of PHC Staff with adequate training and correct knowledge of PPPC services to be provided (vi) computed Prevalence Ratios at 95 % Confidence Intervals to describe the

association of beneficiary (pregnant women) related factors likely to be associated with coverage of PN visits. (vii) Used proportions / numbers to assess health system related factors likely to be associated with coverage and quality of PPPC services provided.

Ethics Statement

This study was approved by the technical advisory committee and the ethics committee of National Institute of Epidemiology, Chennai. Written, voluntary informed consent was obtained from all study participants who were also assured of confidentiality of data and the freedom to withdraw from the study at any time without any repercussions on their rights to receive PPPC services either at a health facility or at home.

RESULTS

Results will be described simultaneously for both home and facility based PPPC services and will include the following: (i) Profile of study participants, (ii) Coverage of PPPC services,(iii) Quality of PPPC services provided, (iv) Factors associated with coverage and quality of Home and facility based PPPC services.

We recruited: recently delivered mothers - 225 within 8-12 weeks – and 20 within 48 hours of delivery; 12 mothers who were due for a PN visit; 94 VHNs, 18 ASHAs, 16 SHNs, 22 MOs and 28 SNs from the 15 selected study PHCs.

Profile of Study Participants (Table: 1)

RECENTLY DELIVERED MOTHER (8-12 WEEKS AFTER DELIVERY).: We successfully recruited 225 mothers for home based assessment. The mean age of mothers was 23.40 (SD – 3.02). Approximately 13 % were illiterates, 93% homemakers, 63 % were from joint families and 89 % had access to Television. Mean Monthly family income was Rs. 7843(SD – 8715.0).

The mean number of Antenatal Checks(ANCs) per mother is 7.32 (SD – 2.45). While 97 % went to government facility for ANCs. In our study 224/ 225 mothers delivered in health institution. The single mother who delivered at home belonged to Thally PHC. Nearly 57 % were male babies. About 96% of children were full term, 2.2% preterm and 1.3% post term. None had any congenital defects. About 11.6% children were low birth weight (<2500g). Post delivery, 11 mothers (due to PIH, PPH, C-section, pedal oedema) and 3 newborns (due to very low birth weight, neonatal jaundice and birth asphyxia) were considered high risk.

RECENTLY DELIVERED MOTHERS (WITHIN 48HRS): A total of 20 mothers were surveyed in the 15 selected PHCs. Since each PHC had on average only 1 delivery per day, we were able to cover all mothers who had delivered in the 15 selected study PHCs at the time of our survey. The mean age of mothers was 22.84 years (SD 2.91years). Fourteen mothers were educated below or up to middle school, 17 were homemakers and 18 were from joint families. The mean monthly family income was Rs.3925 (SD Rs 1369.54).

Mean number of ANCs per mother was 5.10 (SD 2.634). All mothers delivered normal live babies in the PHC. Two mothers were considered High Risk due to anemia and excessive bleeding. All 20 babies were born full term, 13 were males; none had any congenital anomalies and none were considered High Risk. All 20 babies had APGAR score between 8-9/10 at birth. Only 4/20 babies weighed < 2500gms. The mean birth weight of babies was 2832.50 gms. (SD 392.45gms).

Coverage of PN Visits as Reported by Recently Delivered Women

We assessed coverage of PPPC services in terms of the number of postnatal visits actually made to recently delivered mothers and compared this with the number of postnatal visits recommended by different agencies viz. IMNCI, Govt TN, and Govt of India. The IMNCI recommends 3 visits within 7 days. The Government of Tamil Nadu recommends 5 visits and the Government of India recommends 6visits for institutional deliveries and 7 visits for home deliveries within 42 days of delivery.

About 16 % of mothers did not receive any Postnatal (PN) visit as these mothers had gone to their parental home for delivery. In our study since > 99% (224/225) mothers delivered in institutions and stayed there for 48 hours before discharge, we assumed that the first two postnatal visits between 1-3 days after delivery would be provided in the health facility. Thus recommended PN visits at home are: (i) Between 4-7 days = 1visit, (ii) Between 8-42 days = 3visits (GOTN) and = 4visits (GOI).

Our estimated coverage of PN visits at home was: (i) Between 4-7days: 56% (125/225; 95 % CI: 49.01 – 61.96) (ii) Between 8-42days: GOTN: 53.3% (120/225; 95% CI: 46.79 – 59.75) and GOI: 36% (80/225; 95% CI: 29.5 - 41.98). The mean number of PN visits received by mothers is 3 (SD: 2.59).

The mean number of visits according to PHCs showed that women in Alappati PHC received the least (1.2; SD 1.01) PN visits and women in Mudugapalli PHC received the highest PN visits (6; SD 3.75). In 8/15 PHCs (Kakkadasam, Thally, Unichetty, Uthanampally, Santhur, Kannandhalli, Alapatty and Singarapettai) the mean number of PN visits ranged between 1.2 to 2.8 per mother.

Coverage of Pregnant Women in the Health Facility

We used the proportion of recently delivered mothers who stayed in the health facility for 48 hours after delivery as a surrogate indicator for coverage at the health facility. We checked the records in the 15 PHCs surveyed for one month and ascertained that 94% (319/340) of mothers stayed in the PHC for 48 hours after delivery. However with respect to our study subjects, > 99% (224/225) of mothers stayed in the health facility for 48 hours.

QUALITY OF PPPC SERVICES PROVIDED TO PN MOTHERS AND THEIR NEWBORNS AT HOME

We considered several issues to assess quality of PPPC services. From **Table 2** it is clear that between 30-44% of women and their newborns did not receive any PN visits at different recommended time periods. Only 63% of mothers reported that PN visits received were adequate. However all mothers receiving PN visits (84) found it useful. Only 30% (68/225) of mothers **(Figure 1)** and 16% (35/225) newborns **(Figure 2)** received all recommended PPPC services with Kakkadasam PHC being the least performer - no mother and only one child received all PPPC services. At the health facility (PHC) only 4/22 mothers **(Figure 3)** and 13/22 newborns **(Figure 4).** Received all recommended PPPC services

With regard to mothers' postnatal care practices at home, 70% mothers did not apply anything on the cord stump, 75% initiated breastfeeding within 1 hour, 40% bathed the child after 3 days and 75% wrapped the baby in a warm cloth and held the baby close to themselves. Nearly 96% and 71 % of mothers were ignorant about the number of PN visits and PPPC services to be received. At the health facility (PHC), 10/20 mothers initiated breastfeeding within 1 hour, 15/20 applied nothing on the cord stump, 8/20 bathed the baby after one week and 13 /20 wrapped the baby in a warm cloth and

held the baby close to themselves.

FACTORS ASSOCIATED WITH OBSERVED COVERAGE & QUALITY OF PPPC SERVICES

For Home based PPPC services we examined both beneficiary and health system related factors. For Facility based PPPC services we examined mainly health system related factors.

(A) BENEFICIARY RELATED FACTORS

We considered several beneficiary related factors listed in **Table 3 for** univariate analysis and found none to be significantly associated with coverage of Home Based PPPC service.

(B) HEALTH SYSTEM RELATED

Adopting a systems approach, we assessed the health system factors in terms of inputs, and process factors. With regard to *input* factors we observed that staff in position was adequate for all categories of staff with staff PN Ratios ranging from 1: 3 for VHNs/ ASHAs to 1: 2 for MOs and Staff Nurses **(Table 4).** However awareness among staff regarding number of PN visits to be made according to IMNCI is only 12% among VHNs even though nearly 90% had been trained in IMNCI. Awareness among SNs, MOs and SHNs regarding causes and treatment of newborns with BA and NS are detailed in **Tables 5 & 6.**

With regard to essential equipment nearly 8 PHC out of the 15 surveyed did not have a resuscitator and /or suction pump and sterilisers (**Table 7).** Access to some of the PN mothers homes located in difficult to reach areas was a problem for some of the outreach workers. Non availability of a dedicated vehicle for each PHC further accentuated the problem of access.

General lack of supervision of outreach staff and lack of documentation of both home and facility based PPPC activities – appear to be key *process* factors associated with PPPC services. Although the MLR and JSY funds were available, there was delay in receiving and disbursing the same.

DISCUSSIONS

We conducted this community based study to estimate the coverage and quality of both Home and Health Facility Based Maternal and Newborn PPPC services provided and describe associated factors in Krishnagiri district of Tamil Nadu.

Wide gaps were observed with respect to coverage and quality of PPPC services provided in Krishnagiri district. While coverage in the health facility was high, coverage in the home was below recommendations and could be due to low awareness among health workers. This notwithstanding, the PN visits coverage in Krishnagiri district is much higher compared to that observed in other studies.

A cross sectional study conducted in a village on the border of Chandigarh and Mohali, reported a PN visit coverage of 74 % for home deliveries, with 71.5 % receiving a visit within 2 days, 6.6 % within one week and 21.9%. After one week. (Neeraj et al, 2011).[11] Another cross sectional study conducted in Uttar Pradesh reported, that 66 % were institutional deliveries, 44.3% of mothers received no PN visits and only 65% of PN visits were made by skilled persons. (CM Singh et al 2014)[12.] In our study > 99% were institutional deliveries, only 16 % mothers received no PN visits, and 100% PN visits were by skilled persons.

Quality of PPPC services provided both at the health facility and at home were again well below recommended guidelines.

In our study while none of the beneficiary related factors were associated with the observed gaps in coverage and quality of PPPC services provided health system factors appeared to be mainly implicated. However in studies conducted in Punjab[11], Maharashtra[13] and Madhya Pradesh[14], educational status of mothers, number of antenatal checks, mothers and husbands occupation, place of delivery, delivery by trained persons, and awareness of mothers regarding need for PN checks were found to be associated with coverage of PN visits. (Ref Arvind Sharma,Kalpalata et al, Neerja)[11, 13, 14]

We examined health system issues in the context of inputs and processes. With respect to *input* issues we observed that staff availability, staff PN mother ratio etc were satisfactory. In fact one would even go on to comment that in many PHCs, there is overstaffing e.g Kakkadasam PHC has 10 VHNs and 21 ASHAs. Despite this it is one of the least performing PHCs.

Staff performance with respect to coverage, quality of services and knowledge on various issues pertaining to provision of PPPC services is below expectations. This is inspite of most of them receiving relevant trainings. This calls to question the quality of training imparted and also emphasizes the need for retraining of these field staff combined with concurrent monitoring and evaluation of training sessions to assure training quality. Gaps in awareness among SNs regarding symptoms, causes and treatment of BA and NS were also observed which may be because majority have not been trained in Essential Newborn Care. Gaps in service provision are also reflected in the gaps observed in mothers' newborn care practices and their awareness on postnatal care issues.

As regards equipment and supplies, it is clear that all PHCs do not have all the recommended equipments, drugs and supplies. For example only 14 SNs reported availability of advanced resuscitation facilities for BA. The other 14 SNs who did not have access to such a facility were referring the BA newborns to higher institutions.

Access to some of the difficult to reach PHCs and the request for dedicated vehicles appears to be a genuine problem. In some PHCs the distance from the public bus stop to the PHC is almost 1 km. and perhaps difficult to walk for a woman in the late stages of pregnancy. It would be appropriate for the health department to request the transport department to add one more stop near or in front of the PHC, to resolve this issue.

Two important *process* issues that could be associated with gaps in coverage and quality of home based PPPC services to mothers and their newborns are monitoring and supervision provided to grass root workers and tracking of mothers who go to their parental homes for delivery. Low supportive supervision and documentation of routine and supervisory activities are important health system factors likely to be associated with low coverage and quality of PPPC services.

General inaccessibility to internet services at the PHC, compels the VHNs to spend considerable time, effort and their own money by going to local internet cafes to enter PICME data. Hence if the VHNs were to be provided laptops with internet facility and training, this problem can be overcome.

The assistance provided by the VHSC as reported by the VHNs appears supportive and the attitude of the VHNs/ ASHAs towards mothers appears satisfactory as reported by the mothers.

It is thus clear that health system strengthening efforts should focus on providing refresher training for VHNs/ ASHAs/ SHNs/ CHNs and ENC training for SNs and MOs. Training quality should be monitored both concurrently and at the end of training. Mechanisms for supportive on the job mentoring of staff after training should be in place to provide the necessary handholding to ensure that the required knowledge and skills are mastered. Staff awareness regarding provision of PPPC services should be assessed periodically. Appropriate mechanisms for adequate supportive supervision of both outreach and facility based staff should be developed to assure optimal coverage and quality of PPPC services. Effective IEC programmes should be conducted for mothers to improve their awareness regarding PPPC services and practices. All the PHCs should be provided all the recommended equipments, supplies, including transport to meet both routine and emergency needs of mothers and their newborns.

ACTIONS INITIATED BY THE GOVERNMENT OF TAMIL NADU ON STUDY FINDINGS AND PROPOSED RECOMMENDATIONS

The study findings of this study and suggested recommendations were shared with senior health officials of the Government of Tamil Nadu (GOTN). Accepting the study findings and in response to proposed recommendations, the GOTN has initiated the following prompt actions to strengthen PPPC services not only in Krishnagiri district but also in the entire state since they felt that the findings and recommendations for Krishnagiri district would apply to the whole state of Tamil Nadu: (i) Organised 3 days refresher IMNCI training for all VHNs, ASHAs, SHNs and CHNs and SBA training for all MOS and SNs in the state (ii) Carry out internal monitoring of all training sessions conducted to assure training quality (iii) Provided 15 additional vehicles for Krishnagiri district and (iv) Provided registers to document PPPC services to all PHCs in the state.

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APPENDICES

Table 1: Distribution of Recently Delivered Mothers (8-12 Weeks & Within 48 Hours of Delivery) According to Socio Demographic, Obstetric History and Most Recent Pregnancy Particulars

Socio - Demographic Particulars	Home based (n=225)		Facility Based (n=20)
Mother's Age			
<=20 years	**39**	17.30%	**5**
21-25 years	**142**	63.10%	**10**
26-30 years	**38**	16.90%	**4**
31+ years	**5**	2.20%	**0**
Do not know	**1**	0.40%	**1**
Religion			
Hindu	**214**	95.00%	**18**
Muslim	**8**	4.00%	**2**
Christian	**3**	1.00%	
Caste			
BC	**58**	26.00%	**2**
MBC	**80**	35.00%	**3**
SC	**63**	28.00%	**13**
ST	**9**	4.00%	**0**
Others	**15**	7.00%	**2**
Education			

Table 1: Contd.,			
Illiterate	**30**	13.30%	**5**
Primary	**17**	7.60%	**5**
Middle	**63**	28.00%	**4**
Secondary	**100**	44.40%	**5**
Above Secondary	**15**	6.60%	**1**
Mother's Occupation			
Home maker	**209**	92.90%	**17**
Daily wage earner	**13**	5.80%	**3**
Others	**3**	1.20%	**0**
Family Type			
Nuclear	**84**	37.00%	**2**
Joint	**141**	63.00%	**18**
Total Family Income/Month			
1000 - 5000	**106**	47.10%	**17**
5000 +	**118**	52.90%	**3**

Table 2: Distribution of Recently Delivered Mothers (8-12 Weeks & within 48 Hours of Delivery) according to Socio Demographic, Obstetric History and Most Recent Pregnancy Particulars Contd

Mother's Conception and Obstetric History	Home Based (n=225)		Facility Based (n=20)
Mother's Age at Marriage			
<= 20 years	**170**	75.50%	**16**
21 -25 years	**52**	23.10%	**2**
26+ years	**2**	0.90%	**1**
DNK	**1**	0.40%	**1**
Mother's Age at First Conception			
<= 20 years	**117**	52.00%	**11**
21-25 years	**94**	41.80%	**7**
26+ years	**13**	5.80%	**1**
DNK	**1**	0.40%	**1**
Total Number of Pregnancies Experienced			
1	**94**	41.80%	**7**
2	**102**	45.30%	**9**
>= 3	**29**	12.80%	**4**
Total Number of Living Children			
1	**98**	43.60%	**8**
2	**104**	46.20%	**8**
>= 3	**23**	10.10%	**4**
No. of Antenatal Checkups			
<=3	**12**	5.30%	**6**
4-6	**68**	30.20%	**10**
7-9	**109**	48.40%	**2**
10 +	**36**	16.00%	**2**

Table 3: Distribution of Recently Delivered Mothers (8-12 weeks & within 48 Hours of Delivery) According to Socio Demographic, Obstetric History and Most Recent Pregnancy Particulars Contd

Delivery Details	Home Based (n=225)		Facility Based (n=20)
Delivery Outcome			
Live birth	**225**	100.00%	**20**
Mode of delivery			
Normal	**184**	81.80%	**20**
LSCS	**41**	18.20%	**0**
Place of Delivery			
Govt.Hospital	**78**	34.70%	**20**

Table 3: Contd.,			
PHC	**130**	57.80%	**0**
Private hospital/Nursing home	**16**	7.10%	**0**
Home	**1**	0.40%	**0**
Reasons for Choosing PHC for Delivery (Multiple Answer)			
Closer to my house	**104**	46.20%	**14**
Good care provided	**124**	55.10%	**12**
Free of cost	**47**	20.90%	**5**
Better facility	**72**	32.00%	**9**
Cannot afford private care	**14**	6.20%	**4**
Provide all prescribed medicines	**11**	4.90%	**3**
More comfortable at home	**1**	0.40%	**0**
Others	**48**	21.30%	**2**

Table 4: Distribution of Recently Delivered Mothers According to Timeliness of Visits (n=225)

S No	Days of Visit	Mothers Visited (n=225)	
		N	%
1	**1 – 3 days**	**224**	**99%**
2	**4 – 7 days** **>= 1 visit**	**125**	**56%**
3	**8 – 42 days** **>= 2 visits (GoTN)** **>= 3 visits (GoI)** **No Visits**	**80** **33** **68**	**36%** **14.6%** **30.2%**

As per Guidelines Mothers and the Newborn should Receive the Following Visits

- two PN visits between 1-3 days as per IMNCI, GOTN and GOI
- one PN visit between 4-7days as per IMNCI, GOTN and GOI (2 +1=3 visits)
- 2 visits between 8-42 days as per Govt of TN recommendations (2 = +1 +2 = 5 visits)
- 3 visits between 8-42 days as per Govt of India recommendations. (2 +1+3 = 6 visits)

Modified Recommendations for Tamil Nadu

- Between 4-7 days - 1 visit as per IMNCI, GOTN, GOI
- Between 8-42 days - At least 2 visits as per GOTN

- At least 3 visits as per GOI

Table 5: Distribution of Exposures for Recently Delivered Mothers (n=225) (Recd Nil or Less PN Visits as per GoTN Guideline v/s Recd. all PN Visits as Per GoTN Guideline) Univariate Analysis

Beneficiaries related		Mothers Recd. Nil or Less PN Visits as Per GoTN Guideline (n= 105)	Mothers Recd. All PN Visits as Per GoTN Guideline (n=120)	Prevalence Ratio	95% Confidence Interval
Mother Age	**1-19 years**	**6**	**9**	**0;85**	**0.45 - 1.6**
Caste	**BC**	**26**	**32**	**0.95**	**0.68 - 1.31**
	MBC	**42**	**38**	**1.21**	**0.91 - 1.6**
	SC	**33**	**39**	**0.97**	**0.72 - 1.32**
Education	**Below Middle**	**21**	**25**	**0.97**	**0.68 - 1.38**
Family Type	**Nuclear**	**35**	**49**	**0.84**	**0.62 - 1.14**

Table 5: Contd.,					
Family Size	**>= 5 members**	**58**	**63**	**0.94**	**0.71 - 1.25**
Income	**Rs. 1000-6000**	**55**	**72**	**0.85**	**0.64 - 1.12**
Age First Conception	**< 20 years**	**38**	**36**	**1.16**	**0.87 - 1.54**
Total Pregnancy	**Primi**	**42**	**52**	**0.93**	**0.7 - 1.24**
AN Checks	**01-06 checks**	**34**	**46**	**0.87**	**0.64 - 1.18**
Place of birth	**PHC**	**52**	**78**	**0.72**	**0.54 - 0.95**
Birth Weight	**0001-2499 Gms**	**12**	**16**	**0.91**	**0.58 - 1.43**
Knowledge of HW Visit	**Not aware**	**102**	**113**	**1.58**	**0.61 - 4.12**

Table 6: Distribution of Staff of Selected Study PHCs According to Various Particulars, Krishnagiri District, Tamil Nadu

Staff Particulars	PHC Mo	Staff Nurse	SHN	VHN	ASHA
Position	**45**	**49**	**17**	**101**	**61**
Sanctioned	**37**	**42**	**12**	**98**	**53**
Staff : PN Mother Ratio	**3:2**	**3:2**	**3:2**	**1:3.5**	**1:2**
No. of Staff Interviewed	**20**	**28**	**16**	**94**	**18**
Staff Training Details					
SBA	**3**	**26**	**3**	**12**	**11**
IMNCI	**14**	**5**	**14**	**85**	**4**
ENC	**6**	**3**	**1**	**5**	**0**
AMTSL	**16**	**17**	**3**	**22**	**0**

Table 7: Distribution of VHNs and ASHAs in Selected Study PHCs According to their Awareness Levels on Various PPPC Related Issues

S. No	Knowledge / Awareness Issues	VHN (n=94)	ASHA (n=18)
1	**Correct knowledge o number on PN visit according to** **IMNCI** **GOTN**	 **15** **18**	 **3** **11**
2	**Aware about "Excessive bleeding" as a maternal complication within 48 hours of delivery**	**91**	**17**
3	**Aware that maternal death could occur due to complication after delivery**	**4**	**0**
4	**Correct knowledge about treatment for cord stump infection**	**19**	**1**

Table 8: Distribution of MOs, SHNs and SNs in Selected Study PHCs According To Their Awareness Levels Regarding Issues Related To Birth Asphyxia and Neonatal Sepsis

S. No.	Knowledge / Awareness Issues	MO (n=22)	SHN (n=16)	SN (n=28)
1.	**Identification of Birth Asphyxia** **Weak / No cry** **Breathing difficulty** **Cyanosis** **Feeding difficulty / No feeds**	 **16** **8** **13** **3**	 **14** **12** **13** **2**	 **18** **21** **17** **4**
2.	**Causes of Birth Asphyxia** **Prolonged labour / Obstructed labour** **Cord round the neck** **Meconium Aspiration Syndrome (MAS)** **Mal presentation**	 **21** **12** **15** **3**	 **15** **3** **4** **1**	 **22** **7** **24** **5**
3.	**Treatment for Birth Asphyxia** **Clear air way / Suctioning** **Oxygen bag / mask**	 **11** **20**	 **5** **10**	 **15** **18**

	Provide warmth / warmer	**13**	**9**	**17**
4.	**Identification of Neonatal Sepsis** **Fever / Hypertension** **Irritable / Week cry** **Discharge from umbilical card** **Rapid respiration** **Lethargy / Drowsiness / Restlessness** **Convulsion / Seizers**	 **19** **10** **8** **7** **3** **5**	 **12** **8** **15** **0** **2** **0**	 **25** **11** **11** **8** **6** **3**
5.	**Causes of Neonatal Sepsis** **Poor hygiene** **PROM** **MAS** **Poor card care**	 **10** **6** **2** **4**	 **9** **2** **1** **10**	 **15** **7** **1** **14**
6.	**Treatment for Neonatal Sepsis** **Antibiotics** **Referral to high centers**	 **7** **5**	 **4** **2**	 **4** **1**

Table 9: Distribution of Availability and Functionality of Facilities at Selected Study PHCs As Reported By Staff Nurses

S. No.	Facilities at Selected PHCs	Availability (n =28)	Functionality (n=28)
1.	**Baby warmer/Incubator**	**28**	**27**
2.	**Baby scale**	**25**	**25**
3.	**Table lamp with 200 watt bulb**	**6**	**5**
4.	**Refrigerator**	**24**	**23**
5.	**Equipment/reagents for essential lab**	**12**	**12**
6.	**Feeding tubes for baby**	**15**	**14**
7.	**Emergency Drugs and injections**	**27**	**27**
8.	**Laryngoscope and endotracheal intubation tubes**	**21**	**19**
9.	**Mucus extractor/suction tubes**	**25**	**25**
10.	**Facility for Oxygen administration**	**27**	**27**

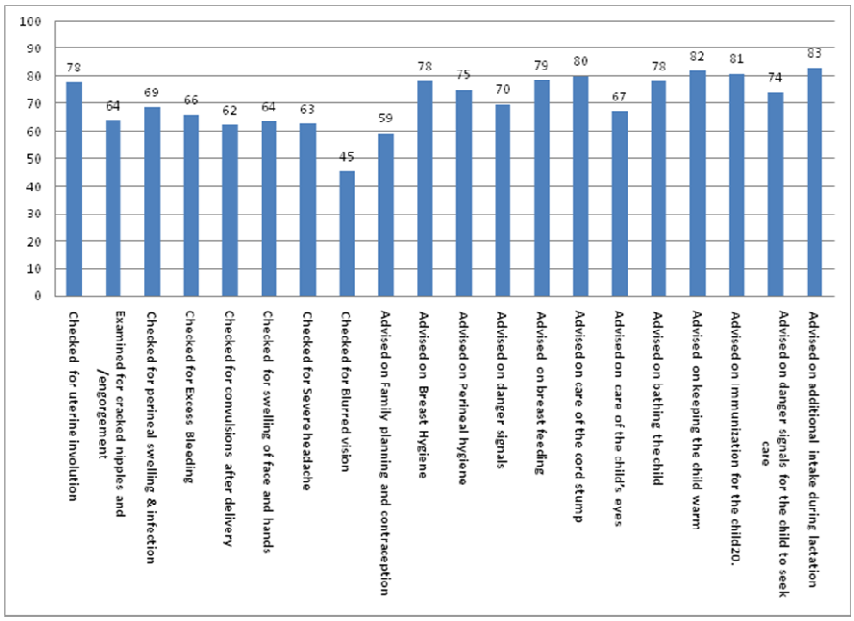

Figure 1: Percent Distribution of Services Received by Mothers as

Reported by Recently Delivered Mothers (8-12 Weeks) (n=225)

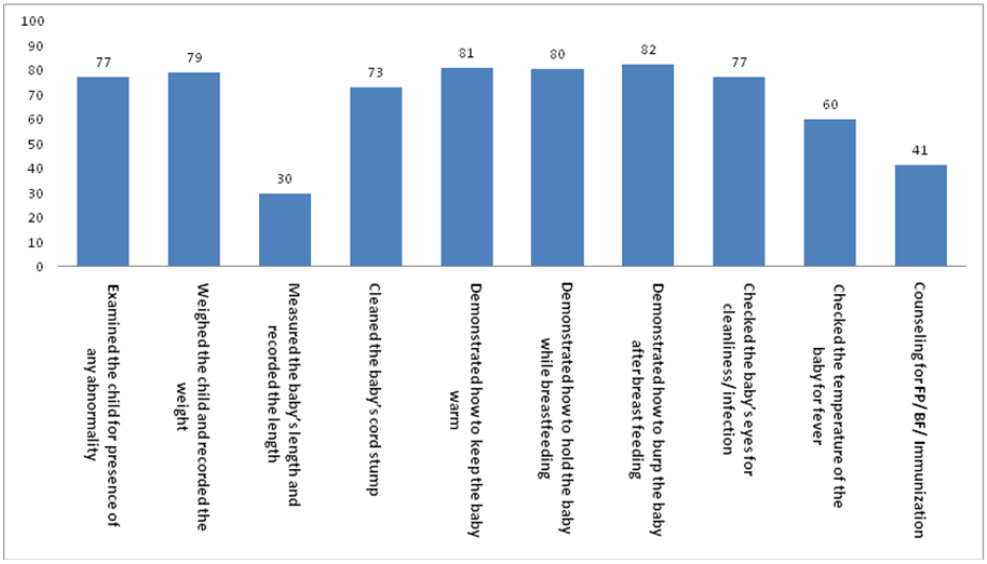

Figure 2: Percent Distribution of Services Received by Children as Reported by Recently Delivered Mothers (8-12 Weeks) (n=225)

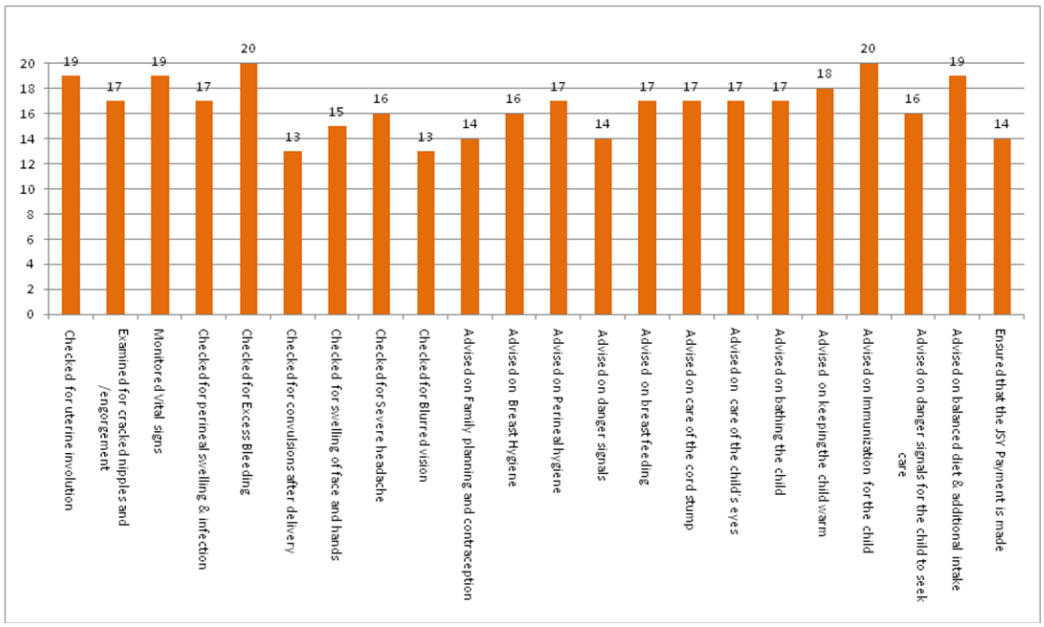

Figure 3: Distribution of Services Received by Mothers as Reported by Women Who Delivered in the Last 48 Hours (n=20)

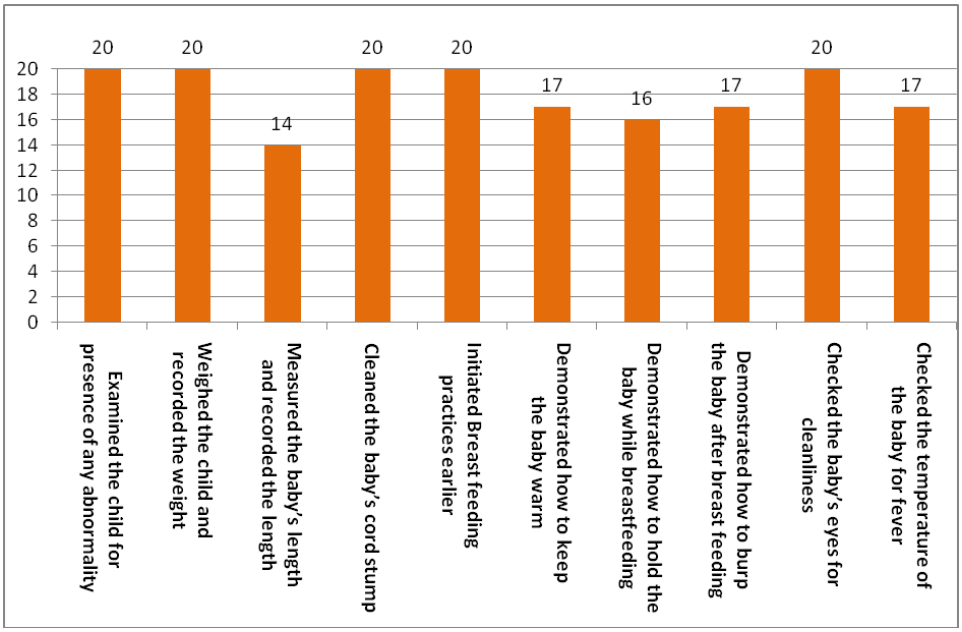

Figure 4: Distribution of Services Received by Newborns as Reported by Women Who Delivered in the Last 48 Hours (n=20)